Course Syllabus

SIPS 533

Academic Year 2025

Department of Physiology

Faculty of Medicine Siriraj Hospital, Mahidol University

Course ID and name:	SIPS 533 MEDICAL CARDIOVASCULAR PHYSIOLOGY
Course coordinator:	Assoc. Prof. Panapat Uawithya, M.D., Ph.D.
Instructors:	Assoc. Prof. Panapat Uawithya, M.D., Ph.D. Assoc. Prof. Wattana Watanapa, M.D., Ph.D. Lect. Luecha Boontaveekul, M.D., M.Sc., Dip. in Thai Board of Family Medicine Lect. Thanus Teeratitayang-gool, M.D. Dip. in Anesthesia
Credits:	1 (1-0-2) (lecture – laboratory – self-study)
Curriculum:	Masters of Science Program in Medical Physiology
Course type:	☐ Core ☑ Required ☐ Electives
Semester offering:	1/2025
Prerequisite:	None
Date of Latest Revision:	16./7./2025

Course Description:

Circulation, cardiac cycle, electrical properties of the heart, electrocardiography, mechanical properties of the heart, control of cardiac output; hemodynamics, vascular physiology, endothelial cell physiology, cardiovascular regulatory mechanisms, alterations in venous return, and physical examination of the cardiovascular system.

Course-level Learning Outcomes (CLOs)

1. Describe key concepts in cardiovascular physiology, including circulation, cardiac cycle, electrical and mechanical properties of the heart, vascular and endothelial physiology, and cardiovascular regulation
2. Apply fundamental cardiovascular physiology to explain normal findings and common circulatory alterations
3. Interpret commonly used cardiovascular parameters, including electrocardiograms (ECG), blood pressure measurements, arterial- and venous-waveform.
4. Communicate basic cardiovascular concepts and physiological reasoning clearly in oral and written forms appropriate for peers and small groups

Constructive Alignment of CLOs and Program's ELOs

CLOs	ELO1	ELO2	ELO3	ELO4

1.	I			
2	R			
3		R	R	
4				R

Remarks: Show the level of the course management with the symbols I, R, P, and M.

Program's Expected Learning Outcomes

1. Demonstrate the current medical physiological knowledge for common clinical application.
2. Evaluate the scientific research and major research developments.
3. Perform medical physiology research with a technique in an ethical way to test an idea or hypothesis in an area of interest.
4. Communicate knowledge and ideas of medical physiological research clearly to peers and the scientific community at national level.

Course Schedule and teaching/assessment plan

No.	Date	Time	Topic	Hours			CLOs	Teaching & learning strategy	Reading from Provided Textbook (Pg)	Assessment (in-class)	Lecturers
				Lecture	Laboratory	Self Study					
1	27 Oct 25	0900-1000	Circulation	1	-	2	1	IL	p.1-16		Dr.Luecha
2	27 Oct 25	1000-1100	Cardiac cycle	1	-		1, 2	IL	P131-136		Dr.Thanus
3	28 Oct 25	0900-1000	Electrical properties of the heart	1	-	2	1, 2	IL	p. 51-71		Dr.Wattana
4	28 Oct 25	1300-1500	Mechanical properties of the heart	2	-	4	1, 2	IL	p. 121-130, 138-160		Dr.Wattana
5	30 Oct 25	0900-1000	Electrocardiography	1	-	2	1, 2, 3	IL	p. 77-106		Dr.Panapat
6	30 Oct 25	1030-1130	Electrocardiography	-	1	1	1, 2, 3, 4	Practical, onsite	p. 77-106, lab direction	Rubric	Dr.Panapat
7	31 Nov 25	1100-1200	Cardiac regulation	1	-	2	1, 2	IL	p. 160-178, 297-302		Dr.Wattana
8	5 Nov 25	1100-1200	Hemodynamics	1	-	2	1, 2	IL	p.13-42		Dr.Luecha
9	6 Nov 25	0900-1000	The vessels	1	-	2	1, 2	IL	p.189-209, 213-221, 246-263		Dr.Luecha
10	10 Nov 25	0900-1000	Endothelial function	1	-	2	1, 2	IL	p.231-241, 266-285		Dr.Luecha

11	12 Nov 25	0900-1000	Cardiovascular regulatory mechanisms	1	-	2	1, 2	IL	p. 355-391		Dr.Wattana
12	12 Nov 25	1700-1800	Q&A I	1				Zoom meeting			Faculty
13	17 Nov 25	0900-1000	Factors maintaining BP	1	-	2	1, 2, 3, 4	KSA		Rubric	Dr.Wattana
14	17 Nov 25	1100-1200	Pulse, blood pressure and the precordium	1	-	2	1, 2, 3	IL			Dr.Luecha
15	18 Nov 25	1000-1100	Cardiovascular monitoring	1	-	2	1, 2, 3	IL	P170-178		Dr.Thanus
16	19 Nov 25	0900-1000	Response to Alterations in Venous Return	1	-	2	1, 2, 3, 4	KSA		Rubric	Dr.Luecha
17	20 Nov 25	0900-1000	Pulse, blood pressure and the precordium	-	1	1	1, 2, 3, 4	Practical, onsite		Rubric	Dr.Luecha
18	20 Nov 25	1700-1800	Q&A II	1				Zoom meeting			Faculty
19	22 Nov 25		Exam (assay 3 hours 1 days)								Faculty
		Total hours of the study		**15**	**2**						

Course Assignments

1. Students are expected to complete assigned readings and participate in discussions. Assignments may include KSA exercise and laboratory reports.

Assessment Criteria

CLOs	Assessment	Proportion (%)
1, 2, 3, 4	Rubric assessment	50
1, 2, 3	Examination	40
4	Attendance	10

2. Students must attend and participate in at least 80% of all activities to pass the course. A minimum score of 50% is required. Grades will be awarded as A, B+, B, C+, C, D+, D, or F based on overall course performance.
3. Rubric-based assessment of performance and participation in practical sessions
4. Written examination evaluated using a letter grading system

Appeal Procedure

1. An appeal can be made by a student to the course coordinator or the graduate program director.

Course Materials

Required Textbook:

1. Rhoades & Bell. Medical Physiology, 4th Edition. Lippincott Williams & Wilkins.
2. Boron & Boulpaep. Medical Physiology, 3rd Edition. Elsevier.
3. Additional readings or handouts will be provided throughout the course.